



RADIO AMATEUR ASSN.

Ø BEAT



COLO. SPRINGS,
COLORADO

JANUARY 1983

Up In The Sky ... It's A Bird ... It's A Plane

UNSNARLING SIGNALS IN SPACE

All modern communications satellites are "repeaters" — they pick up faint messages from the ground, amplify them and retransmit them on a different frequency. A frequency in the vicinity of 6 gigahertz is commonly used for transmissions up to the satellites, with a 4 gigahertz for downward transmissions.

Most of the frequencies near 6 and 4 gigahertz that are set aside for satellite communications are already in use, and those nearby are devoted to other services such as radioastronomy and navigation radar. The use of additional frequencies would allow extra messages to be relayed through space. And if higher frequencies were also used, satellites could be spaced closer together, because an antenna sends out a thinner beam if its is transmitting at a higher frequency.

Some communications satellites are already using 11 GHz uplinks and 14 GHz downlinks, and tests are being conducted in the vicinity of 30 GHz. The latter would make possible satellite spacings as close as 1 degree. However, use of these higher frequencies would require new ground antennas and much larger and more expensive satellite antennas.

Another difficulty is that falling rain drops tend to absorb higher-frequency radio waves. Possible solutions include spacing pairs of ground antennas several miles apart so that at least one is likely to lie outside a heavy rainstorm. Another possibility is mounting 30 GHz antennas on tethered, super pressure balloons. Optical fibers running the length of the tether would carry clear signals up and down through the rain.

We can achieve much more complete reuse of frequencies with "multibeam" satellite antennas. These transmit a family of pencil-thin beams often so narrow that by the time they reach the ground, their "footprint" covers an oval only a few dozen miles wide. As a result, the same frequencies are available for multiple reuse in widely scattered areas.

Multibeam antennas are larger, heavier, more

complicated and more costly than their simpler counterparts but their extra capabilities will become increasingly attractive as available frequencies are expended. Some military satellites already employ multibeam antennas, and when the space shuttle is available for delivering large structures into space, they will be widely adopted for civilian applications.

Another way to control traffic at the geosynchronous altitude is to install a few large multifunction platforms for communications relays. Such platforms would be equipped with several antennas, each operating on a different frequency and devoted to a different service. Use of such platforms would eliminate the need for multiple relays through several satellites.

Critics of malfunction platforms have argued that they will be inefficient because each one will have to be positioned at a compromise location in space. Malfunction of an insignificant part could require replacement of the entire complex. Only time will tell if the apparent advantages of multifunction platforms outweigh the disadvantages.

From Technology Review

Frank, WBØPAJ

TIME TO RENEW YOUR MEMBERSHIP

It's that time of year again — dues for the 1983 calendar year come due in January. Your continued support of the club through your dues makes it possible for the PPRAA to function as an effective organization.

On page 5 is the form to renew. Please fill in all the information requested and make sure it is correct, as the club uses this to make up our membership and mailing lists.

One other thing—support of your club through your dues is important. Equally important though is the time you give to the group. Coming to meetings or participating in functions is just as important. Involvement is the key—make this your year to give of your time as well as money.

P.P.R.A.A. DIRECTORS

PRESIDENT	*Dave Vierling NØDV 2511 N. Tejon 80907	473-0293
V. PRESIDENT	*Charlie Biggs KCØTI 302 Quebec 80911	392-1476
SECRETARY	Mark Richardson KAØJXW 24 N. Union 80909	473-1799
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Board Member	Tom Weatherly ADØO 2010 N. Carlton 80909	475-0192
Board Member	Karl White K4DQ 4460 Nonchalant Circle 80917	597-4805
Board Member	*Jake Jacobs NØCYR 104 Old Broadmoor Rd. 80906	634-2223

ZERO BEAT is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association, Inc., Colorado Springs, Colorado. Permission is given to reprint articles or excerpts provided credit is given. Deadline for submission of articles is the 21st of the month. Classifieds accepted anytime.

The Pikes Peak Radio Amateur Association meets on the second Wednesday of every month at the First United Methodist Church, 420 N. Nevada, at 7:30 p.m. All amateurs and interested parties are invited to attend.

Editor: Don Lohse KBØKQ, 1410 E. LaSalle, Colorado Springs, CO 80907 635-7469

DECEMBER MEETING MINUTES

The December meeting of the Pikes Peak Radio Amateur Association was called to order by President Dave Vierling NØDV at 7:32.

Since there was no pressing business before the meeting, the program of Homebrew Night began immediately. Projects were displayed and explained, and prizes awarded to NØCYR, NØDV AND AAØL.

After break, (a long one) the drawing was held, and then Ray AAØL continued his November program of antenna and feedline misconceptions and the talk evolved into a wide-ranging discussion.

The meeting was adjourned at 9:45.

Respectfully submitted,
Don KBØKQ for Mark

MEETING NOTICE

The January meeting of the Pikes Peak Radio Amateur Association will be held on January 12 at 7:30 p.m. at the First United Methodist Church located at the corner of Nevada and Boulder streets. The program concerns AMSAT, and with the upcoming and hopefully successful launch of another amateur satellite, this could be the time to get those questions about station requirements and procedures answered. Ed Means, WØVO will speak. All members and other interested persons are encouraged to attend.



Zero Beat editor without
your help.

FOR SALE: Heath Sixer and Twoer, SBE 34 mobile SSB xcvr., Heath Shawnee 6 meter xcvr., Knight T 150 trans., McMurdo Silver signal generator, Western Union teleprinter, 2 stereo turntables, several car radios, a whole bunch of speakers, tubes, components, wire, KØCI, Steve Saarschmidt 596-6594.

FOR SALE: Wood office desk 34" deep by 60" wide-\$25. Jim Anderson KØDNE 471-3576 after 5:30 p.m.

FOR SALE — TS 820S w/CW filter, spkr., MC 50 mike \$550 or \$500 w/o mike or spkr. HW 101 w/ p.s., CW filter & spkr \$300-save \$245 on kit price. Heath HD 1410 keyer \$40-save \$25 on kit cost. Johnson Viking 2 \$150-good AM or lowband CW transmitter. HRO Junior \$150-early HRO model, 1935 vintage, a real antique, w/p.s., all coils and spkr. Mon-Key electronic keyer \$10-one of the first commercial electronic keyers. ASR 33 teletype \$100-very clean, excellent cond., little use. IDS 125 dot matrix printer \$150-baud rates to 1200, multiple font sizes, parallel or serial interface. 40 meter folded dipole \$20-w/ low loss wire balun.

Tom Weatherly ADØO 475-0192.

Typesetting courtesy Letter Setters

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Some Static About Static

You can never be sure if you or the items you are working with has a static charge. But small charges up to 100 volts are common and large charges up to 35000 volts could be present.

examples

A person after walking on a carpet

- up to 35000 on a dry day
- up to 2000 on a damp day

A person walking on a vinyl floor

- up to 12000 on a dry day
- up to 400 volts on a damp day

A person on a padded chair

- up to 18000 volts

Styrofoam coffee cup

- up to 5000 volts
- Plastic solder sipper
- up to 8000 volts at tip
- Plastic or scotch tape
- up to 5000 volts
- Vinyl covered notebook
- up to 8000 volts

Electro Static Discharge

- TO FEEL IT — 3500 volts or more required
- TO HEAR IT — 4500 volts or more required
- TO SEE THE SPARK — 5000 volts or more required

Many electronic components including those in the chart below are susceptible to damage from static discharge. Voltages far less than you can feel, hear or see can degrade or completely destroy components.

ESD Susceptibility Of Various Electronic Devices

Device Type	Range of ESD Susceptibility (volts)
VMOS	30 to 1800
MOSFET	100 to 200
GaAsFET	100 to 300
EPROM	100
JFET	140 to 7000

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Film Resistors (Thick, Thin)	300 to 3000
Bipolar Transistors	380 to 7000
ECL (PC Board Level)	500 to 1500
SCR	680 to 1000
Schottky TTL	1000 to 2500

April 1982 CORA

SPORTS FESTIVAL

The National Sports Festival, to be held at the end of June, is an opportunity for all the amateurs in El Paso and Pueblo county to participate in a public service event of major proportions. We are talking big time here—nothing small at all about the job that needs to be done. We did the communications for the first two festivals, and broke a lot of ground. We learned and the USOC learned. At later festivals, this learning was used to help the hams of the cities where the other festivals were held.

It's our turn again now, and we have some work to do make sure that we do the kind of job that we can do.

Take some time to think about your role in the activity, and make sure you get involved. Help is need in all areas, and this is a great event to help on.

So get that HT charged up, build a 1/2 wave for it, maybe an external power pack—and get your name in—come to the meetings, the Festival will be a regular subject of discussion.

FOR SALE: Heathkit phone patch in excellent condition.
Phone 635-3373. Frank Craw WØHWH

COMPUTER PEOPLE TAKE NOTE

3 New computer bulletin board especially for ham radio.
Everybody welcome. 597-7498. Lee Sublet WØBLD.

BOARD MINUTES

The December Board meeting of the Pikes Peak Radio Amateur Association was called to order in Dave's (NØDV) home at 7:55 p.m. Members present were Dave, NØDV; Charlie, KCØTI; Mark, KAØJXW; Les, KCØNC; Bud, NØDDF and Tom, ADØO.

A need to have a current list of standing committees was expressed. Also, the board asks that anyone willing to help serve on a committee contact a board or committee member. Current active committees and heads are: Education—no chairman; Membership—no chairman; Activity—the board has been serving in this capacity; Publicity—Mark Richardson and Don Lohse for Zero Beat; Interference—Greg Utterback; and Nominating—board. The page of the current by laws pertaining to committees will be published soon in Zero Beat.

Members have found a possible location for this years Swapfest in April. The location is larger than last years and has plenty of parking. It will be announced once plans are finalized. The board also authorized that up to \$400 be utilized for the purchase of the grand prize. Tentatively, the prize will be a Vic-20 computer with the 8K RAM add on module plus a gift certificate for software and documentation. One thousand tickets will be available at \$1.00 each or 6 for \$5.00.

Identification cards with the club name and logo and spaces for a member's name and call cost \$23.00 for 1000. Bud moved, Charlie seconded that 1000 cards be printed. The motion passed unanimously.

No new articles for Zero Beat were presented to the board. Articles are needed and can be sent to Don Lohse—KBØKQ.

Ed Means has agreed to do a program on satellites at the January meeting. The February meeting will be on receivers.

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There being no further business, the board adjourned at 9:40 p.m. The next meeting will be at Tom's—ADØO.

Respectfully Submitted,
Mark, KAØJXW

WINTER SWAPFEST

A Winter Swapfest will be held Feb. 18, 19 and 20 at 637 Winters Drive in Colorado Springs. This is across the street from the Dog Track. This is an indoor fest, and come to buy, sell or trade. New and used ham gear, CB's, stereo gear, scanners, etc. Miley's Radio from Florence will be up with a lot of gear.

The swapfest will be open Friday the 18th from noon to 4 p.m. and Saturday and Sunday the 19th and 20th from 8 a.m. to 4 p.m.

This is a large building, and the spaces which will sell for \$12 will each hold 2 or 3 4 X 8 tables—so double or triple up. Bring what you want to sell or trade. There is an open air flea market down the street.

Everyone is welcome. For information call either 591-2886 or 1-784-3040 for information and reservations.

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*Santec ST144up Reg. \$326.00 Sale \$289.00
Hygain 18AVT Reg. \$129.95 Sale \$109.95
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Disc drive or printer for VIC 20 \$349.00 Sale \$79.95

USED EQUIPMENT

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Kenwood TS 108S w/DFC \$575.00
Yaesu FT 301D, FT 301 p.s., YD 844 mike-package \$499
Tempo 55T \$189.00
Icom IC 502 \$149.00
Izden PCS 2000 \$199.00
KDK FM 2015 w/TTM \$199.00
Kenwood TR 7800 \$259.00
Yaesu FT 207R w/spkr. mike \$209.00

Swan 270 \$249.00
Henry PS-1220B w/130A10 VHF Amp-package \$185.00
Drake TR3/MS4 \$225.00
Collins R-390 as is \$125.00
Dentron MT 3000A tuner \$175.00
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Icom 2A Reg. \$239 Now \$219.
Extra Icom batteries, chrgs. & etc. in stock.
New Icom 70 Receiver List \$749 Sale \$639.
New Azden PCS 4000 \$285.
New KDK 2030 mini 25W w/TTM \$279.
Janel QSA5 2 meter preamp \$45.
New Azden PCS 300 HT \$285.
Kantronics VIC 20 and others interface \$180.
Kantronics Hamsoft for VIC 20 \$47.
AEA MT-1 Code Trainer \$90.
Yaesu 844 Desk Mikes \$20.
VoComm Power Pocket—25w amp/battery charger & eliminator for
Icom IC 2A(T). Makes a 25w mobile out of your 2 A(T).
List Price \$229. Introductory price \$189.

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USED EQUIPMENT

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Wilson 1402 SM HT w/ desk charger \$125.
Icom 255A standard mike \$200.
Kenwood TR 2400 w/standard accessories \$195.
Kenwood TR 7625 synthesized 25W 2 mtr. Xcvt. w/RM 76
microprocessor control. 6 memory scan \$195.
Yaesu FT 207R HT \$195.
Santec 1200 2 meter HT-synthesized \$195.
Santec desk quick charger \$65.

Swan FM 2X w/ac supply \$125.
Genave GTX 2 12 ch. 2 meter FM, local xtals \$90.
KDK 2015 synth. 2mtr. mobile w/4 mem. scan & AF MARS \$150.
Tempo S1T synth. 2 watt HT w/TTP, wall and desk chgr., duck and
extendable antenna. Similar to Icom IC2AT \$185
Icom 2030 synth. 2 mtr. \$150.
Tempo VHF-1 synth. 2 mtr. mobile-digital-144-148 & 2
programmable channels \$150.
Heath SM 118A freq. counter-30 MHz \$75.
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MARS & CAP locks-will transceive as pair \$200.
Galaxy DC1000 mobile power supply \$50.
Yaesu FT 101E-latest version-w/service man., extender boards,
10 MHz band, FR 101D digital gen. cov. rcvr, CW filter, Land
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Heath SB 201 amp. w/o 10m. Perfect condition \$325.
Homebrew 900W linear. 4-811A's, small size and good power.
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ANTENNAS

Mini Products HQ1 Mini Quad. 6-10-15-20.
Reg. \$159.50-sale \$149.
Larsen 2 meter mobile antennas-20% off list.
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Coming Feb. 1 — the new ARRL "The FCC Rulebook"

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